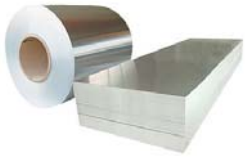
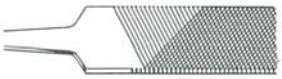
Cold Metalwork

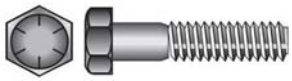
294. Adjustable Trammel Points **Section: 9** Used for laying out large circles, arcs, and patterns. Consists of two scribe points with set screws that attach to a 3/8 by 3/4 inch wood or metal bar. The bar can be any desired length. The trammel points can be adjusted to any point on the bar.	
42. Adjustable Wrench **Section: 2** Size is designated by the length in inches of the handle. Jaws of the wrench are adjustable.	
231. Aluminum **Section: 7** Is sold by the square foot, by the piece or by the pound. Light gray color.	
301. Angle Grinder **Section: 9** Available in sizes from 2 to 9 inches. May be used with grinding, sanding, or wire brush wheel.	
82. Anvil **Section: 3** Sizes range in weight from 20 to 200 lbs. Used to shape cold and hot metal.	
296. Aviation Snips **Section: 9** Available in straight, left or right. Compound action makes cutting easier and the jaws are usually serrated. Also called Compound Snips.	
261. Ball Pein Hammer **Section: 8** This hammer is constructed with a ball (pein) at one end and a round crowned hammering face at the other. Also called a Machinist's Hammer.	

262. <u>Blacksmith's Hammer</u> **Section: 8** The hammering surface is crowned. Designed for use in forming hot metals.	
77. <u>Bolt Cutters</u> **Section: 3** The toggle and lever joints develop great mechanical advantage. Commonly used to cut bolts, chain, and reinforcing bar.	
283. <u>Bottoming Tap</u> **Section: 8** Used to complete threads to the bottom of a blind tapped hole after using a taper tap to start the threads. Widely used in machine operations.	
299. <u>Brake</u> **Section: 9** Used to bend sheet metal at various angles.	
53. <u>C Clamp</u> **Section: 2** The screw has a sliding bar or a thumb screw at one end, and a ball and socket pad at the other end. Sizes range from 2 to 12 inches.	
55. <u>C Clamp Locking Pliers</u> **Section: 2** Used for clamping irregular shapes quickly and firmly when welding or fastening.	
126. <u>Cap Screw</u> **Section: 4** A threaded screw for machine parts; screws into a tapped hole. It resembles a short bolt with a hexagon head with either coarse, fine, or metric threads.	
267. <u>Cape Chisel</u> **Section: 8** Used for cutting keyways and groves. Can also be used to cut off large rivets or other projections. Useful for tight places where a cold chisel is too large. Sized by the width of the cutting edge.	

97. Carpenter's Level **Section: 3** Used for marking level lines and for checking surfaces for level and plumb. Typical length is 24 to 48 inches. Longer levels are often called masonry levels since they are commonly used to lay brick.	
11. Center Punch **Section: 1** Is used to place a small indentation in metal before drilling. This prevents the drill bit from scoring its own starting position. They are made in various diameters and lengths.	
99. Chalk Line **Section: 3** A special container contains the chalk powder and string line which is on a winding spool. Excellent to use in marking long lines on floors, plywood, and roofs.	
252. Chuck **Section: 7** Used to hold a drill bit in a drill press or drill motor. Some portable drills use a keyless chuck and they are tightened by hand.	
251. Chuck Key **Section: 7** Used in a keyed chuck to tighten or loosen the chuck.	
268. Cold Chisel **Section: 8** Used to cut rod or small bar stock to rough sizes by nicking opposite sides and then bending it until it breaks. Size is determined by the width of the cutting edge.	
91. Combination Square **Section: 3** A level and a scribe are contained in the beam. May be used to measure 45 and 90 degree angles.	
256. Countersink **Section: 8** The shank is 1/4 inch in diameter and can be used in hand or power drills. Makes a groove to allow the head of a screw to fit below the surface of the metal or wood.	

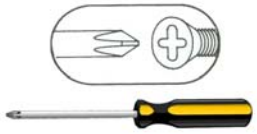
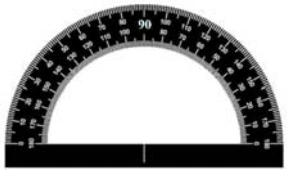
84. <u>Cut Off Saw</u> **Section: 3** Cutting wheels are disposable. Used for cutting steel bar and pipe.	
106. <u>Depth Gauge</u> **Section: 3** Usually graduated in 32nds and 64ths of an inch.	
101. <u>Dial Caliper</u> **Section: 3** Capacity is from 0 to 6 inches.	
269. <u>Diamond Chisel</u> **Section: 8** Used for cutting keyways and groves. Useful for tight places where a cold chisel is too large. Sized by the width of the cutting edge.	
288. <u>Die Stock</u> **Section: 8** Used as a handle to turn the dies to make threads.	
105. <u>Dividers</u> **Section: 3** Used for marking out circles or parts of circles, for transferring or duplicating short measurements, and for dividing distances into a number of equal parts.	
276. <u>Double Cut file</u> **Section: 8** Used for rough filing and to remove large amounts of metal. Double cut files have two series of diagonal teeth, one crossing the other. This file is made in three grades of coarseness and are manufactured in flat, square, round, warding and knife shape	
254. <u>Drill Drift</u> **Section: 8** Used for removing morse taper sleeves and tapered shank twist drills from a drill press or lathe. Also known as a Center Key.	

355. <u>Drill Press</u> **Section: 10** A machining tool used to drill a variety of hole making operations. All work should be clamped to its table and smaller pieces in a drill press vise.	
58. <u>Drill Press Vise</u> **Section: 2** Drilling is safer, more accurate, and fewer drill bits are broken, when a vise is being used.	
354. <u>Electric Drill</u> **Section: 10** Used for drilling holes. Sizes range from 1/4 to 1 inch and larger capacity drill bits. Smaller size drills are held single handed, while larger sizes should be held using both hands. Many models are variable speed and may have a keyless chuck.	
81. <u>Face Shield</u> **Section: 3** Eye protection that covers the entire face. Often used with safety glasses when full protection of the face is required. Used when grinding or cutting metals.	
107. <u>Feeler Gauge</u> **Section: 3** Used for gauging the clearance or spacing of valve tappets and other jobs where accurate measurements of .001 to .032 is desired.	
279. <u>File Card</u> **Section: 8** Used to clean material out of the file teeth which prevents slippage. The card is a small fine wire brush.	
272. <u>File Handle</u> **Section: 8** Used to maintain a better grip on a file and to prevent the tang of the file from puncturing the palm of the hand. Sizes vary depending on the size of the file tang.	
292. <u>Flat Leg Pattern Dividers</u> **Section: 9** Used for the same purpose as wing dividers. They are spring loaded and the tips move automatically when the adjusting screw is turned. Used for precision transferring of segments from pattern to pattern.	

145. <u>Flat Washer</u> **Section: 5** Used to prevent the nut from rubbing and becoming imbedded in the bolted material. Also called a Cut Washer.	
102. <u>Fractional Vernier Caliper</u> **Section: 3** Used for precision measuring, direct reading of 16ths and 32nds of an inch on the handle, and the vernier readings are of 1/128ths of an inch.	
93. <u>Framing Square</u> **Section: 3** Are marked in 12ths of an inch on the back side. Also called a Carpenter's or Steel Square. Many of these squares are inscribed with rafter tables.	
234. <u>Galvanized Sheet</u> **Section: 7** The coating varies from 0.0002 inch for the lightest coating to 0.002 inch for water pipe. Patching gray of light to dark grays.	
131. <u>Grade 2 Bolt</u> **Section: 4** A bolt that has no markings on the head and is made from low or medium carbon steel. It is commonly used for landscape applications and other applications where strength in not important.	
132. <u>Grade 5 Bolt</u> **Section: 4** Made from medium carbon steel that has been quenched and tempered. A mildly hard bolt used in machinery and equipment applications. There are three markings on the head of the bolt.	
133. <u>Grade 8 Bolt</u> **Section: 4** A hardened bolt used where high tensile strength is required. There are 6 markings on the head and is made from medium carbon alloy steel that has been quenched and tempered.	
302. <u>Grinder</u> **Section: 9** Used for sharpening and removing material. Stones are classified by their diameter, width, and coarseness (grit). (i.e. 1" x 6" - 80 grit).	

290. Hack Saw **Section: 9** The handle normally has a pistol type grip. The teeth of the blade face the handle and the cutting occurs in the upward stroke.	
274. Half Round File **Section: 8** Used on metal or wood for concave circular surfaces or inside large holes. It is made in bastard, second cut and smooth teeth; and is 5 to 16 inches long.	
265. Hand Drilling Hammer **Section: 8** The head is made in three different sizes, 2, 3, and 4 pounds. It has a short handle and can be used in tight places to drive punches, star drills, chisels, and hardened nails.	
45. Hex Key **Section: 2** This wrench is made of hexagon stock with one end bent to a 90 degree angle. Also known as an Allen Wrench.	
137. Hex Nut **Section: 4** It may have NC, NF or metric threads.	
300. Hydraulic Shear **Section: 9** Powered by a hydraulic pump and cylinder, these shears commonly can cut flat stock, angle iron, and punch holes.	
103. Inside Calipers **Section: 3** The calipers are adjusted to the diameter of the object and then laid on a rule where the reading is taken.	
144. Lock Washer **Section: 4** Used to keep the nut from coming loose; should not be used on wood.	

10. <u>Locking Pliers</u> **Section: 1** Used as a gripping tool, pipe or locking wrench, adjustable wrench, or vise. Locks with a toggle action that holds until the lever is opened. Commonly called Vise-Grip Pliers.	
54. <u>Locking Welding Clamp</u> **Section: 2** Works well when clamping two pieces adjacent to each other or at a 90 degree angle.	
130. <u>Machine Bolt</u> **Section: 4** A bolt with a square or hexagonal head on one end and a threaded shaft on the other end; used to connect metal parts.	
129. <u>Machine Screw</u> **Section: 4** The head is slotted for a screwdriver and may be either round or flat. Generally a smaller fastner (less than 1/4" in diameter), the shaft is threaded the entire length. Typical sizes vary from 4 to 12.	
59. <u>Machinist's Vise</u> **Section: 2** A bench mounted vise for metal with a swivel base and replaceable jaws. It should not be used for hammering or bending metal. Also known as a Bench Vise.	
100. <u>Micrometer</u> **Section: 3** Used in precision measuring. Normal sizes range from 0 to 1 inch and up to 12 inches. Care should used when handling.	
253. <u>Morse Taper Sleeve</u> **Section: 8** Used as an adaptor to insert different sizes of tapered shank twist drills into the drill press or lathe.	
560. <u>Non-Woven Abrasive Pad</u> **Section: 16** A plastic abrasive pad. It is non-rusting and washable. Commonly called a Scotch-Brite pad (3M brand name).	

104. <u>Outside Calipers</u> **Section: 3** The calipers are adjusted to the outside diameter of the object and then laid on a rule where the reading is taken.	
17. <u>Phillips Screwdriver</u> **Section: 1** Used to drive screws into and out of various materials. Always select the correct size for the application. Tip sizes are numbered #0, #1, #2, #3 and shank lengths will vary.	
284. <u>Plug Tap</u> **Section: 8** Used to cut threads in machine operations.	
176. <u>Pop Rivet</u> **Section: 5** A pop rivet tool is required to set the rivet.	
175. <u>Pop Rivet Tool</u> **Section: 5** It sets the rivet and is adjustable for various diameters of rivets.	
14. <u>Prick Punch</u> **Section: 1** Prick punches are used for marking. The punch should be sharp and ground to 30 degrees.	
108. <u>Protractor</u> **Section: 3** Used to mark angles. It is graduated from 0 to 180 degrees.	
47. <u>Pry or Fitting Bar</u> **Section: 2** It is long, round and tapers at one end, and at the other end, it has a curved pry hook.	

258. <u>Reduced Shank Drill</u> **Section: 8** The shank of the drill comes in three sizes, 1/4, 1/2 and 3/4 inch.	
177. <u>Rivet Set</u> **Section: 5** A rivet set is a small bar of steel with a hole drilled in the end to receive the rivet, and with a cup-like depression to form the round head on the rivet.	
273. <u>Round File</u> **Section: 8** Used for wood and metal working. It is made in bastard, taper and double cut, second double cut and a special coarse cut for woodworking. Lengths vary from 4 to 16 inches and 3/16 to 3/4 inches in diameter. It is also called a Rattail File.	
270. <u>Round Nose Chisel</u> **Section: 8** Used to cut an oil groove in a bearing. The sides of the shank are flattened and the width at the cutting edge determines the size.	
286. <u>SAE Die</u> **Section: 8** Used to cut Society of Automotive Engineers (SAE) or National Fine Threads (NF) on bolts.	
280. <u>SAE Tap</u> **Section: 8** Used to cut Society of Automotive Engineers (SAE) or National Fine Threads (NF) in bored holes and nuts.	
79. <u>Safety Glasses</u> **Section: 3** Safety glasses have side shields and cover the eyes. The California State Educational Code states that all students, teachers, and visitors in a school shop must wear eye protection.	
80. <u>Safety Goggles</u> **Section: 3** Eye protection that covers eye glasses.	

110. <u>Scratch Awl</u> **Section: 4** Used to mark wood or sheet metal. Also used as a punch for making small holes in light gauge sheet metal for the insertion of sheet metal screws.	
289. <u>Screw Extractor</u> **Section: 9** A hole is drilled in the center of the broken stud, and the extractor is screwed into the hole counterclockwise to remove the broken stud. Also known as an Easy Out.	
353. <u>Screwdriver</u> **Section: 10** Comes in many shapes and sizes. These power tools are battery or AC powered, reversible, and variable speed. They are commonly used for dry wall or decking installation. Many models have a high speed range for drilling.	
111. <u>Scribe</u> **Section: 4** Used to mark sheet metal. The tip is brittle and will snap off if dropped on the point or used as a center punch.	
151. <u>Self Drilling Screws</u> **Section: 5** No pre-drilling is necessary when using a self drilling screw.	
155. <u>Self Tapping Screws</u> **Section: 5** This screw has a sharp point with coarse threads that makes their own threads when screwed into a pre-drilled hole that is smaller than the diameter of the screw.	
139. <u>Self-Locking Nuts</u> **Section: 4** When tightened on a bolt, the scored threads bite into the threads of the bolt preventing it from backing off.	
297. <u>Shear</u> **Section: 9** A powered hand tool or Unishear is used to cut sheet metal up to 12 gauge.	

291.	**Sheet Metal Layout Rule** — **Section: 9** Used for laying out straight lines on sheet metal. The rule is 1-1/4 inch wide and 48 inches long. It is very flexible and is used to measure around curves. It is graduated in 1/8, 1/16, and 1/32 of an inch.	
152.	**Sheet Metal Screws** — **Section: 5** Head types are flat, round, pan, oval and binding.	
298.	**Sheet Metal Shear** — **Section: 9** Used to cut sheet metal up to 16 gauge. Most shears are foot operated.	
275.	**Single Cut File** — **Section: 8** Used to produce a smooth surface or keen edges on tools and implements. It is used with pressure on the outward motion. It has a single series of teeth and is made in bastard cut, second cut and smooth type teeth.	
95.	**Sliding "T" Bevel** — **Section: 3** After it is set at the correct angle, it is much the same as a square.	
4.	**Slip Joint Combination Pliers** — **Section: 1** Useful for a variety of small and/or large jobs. Used to hold flat or round items, to cut and/or twist soft wires.	
18.	**Slotted Screwdriver** — **Section: 1** Used mostly in woodworking applications. Tip sizes will vary in width 1/4", 5/16", and 1/2". Shank lengths will also vary. Use the correct tip size for each application.	
109.	**Soapstone** — **Section: 4** Unlike chalk, it is hard enough not to mark hands or clothing and can be used in holders that resemble pencils.	

178. <u>Soft Iron Rivet</u> **Section: 5** The size is based on length and diameter.	
527. <u>Spot Welder</u> **Section: 15** Used to weld a small spot in sheet metal.	
277. <u>Square File</u> **Section: 8** Used for enlarging holes or recesses, mortises, keyways, and splines. Comes in bastard, second cut and smooth. File is tapered and comes is various sizes and lengths.	
89. <u>Steel Tape</u> **Section: 3** It should be cleaned after each use and kept free from dirt and rust.	
257. <u>Straight Shank Twist Drill</u> **Section: 8** Used to drill holes in metal or wood. If used on hard steel and at high speeds, it should be made of high speed steel.	
19. <u>Stubby Screwdriver</u> **Section: 1** The screwdriver will have a slotted or phillips tip, and a blade length of 1-1/4 to 1-1/2 inches long. Used to drive screws in and out of various materials and in a confined space.	
285. <u>Tap Wrench</u> **Section: 8** "T" type tap wrenches have an adjustable chuck. The tap wrench is used to allow the operator to turn the tap in the hole or nut.	
278. <u>Taper or Three Square File</u> **Section: 8** Used for filing all types of hand saws with 60 degree angle teeth. The edges are set and cut to file the gullet between saw teeth. It is made in taper, slim, and extra slim taper.	

282. <u>Taper Tap</u> **Section: 8** Used in hand threading operations to start threads and in cutting threads full in a through hole. Also used to start threads in a blind hole.	
259. <u>Tapered Shank Twist Drill</u> **Section: 8** Used in a drill press or lathe to drill holes.	
295. <u>Tin Snips</u> **Section: 9** There are four types available; regular straight snip, curved (left and right) snip, duckbill snip, and aviation snip. Designed to cut sheet metal less than 20 gauge.	
266. <u>Tinner's Hammer</u> **Section: 8** The hammer head is beveled on one end and has a square face on the other. Used to dress sheet metal by closing and opening seams.	
245. <u>Tool Steel</u> **Section: 7** It can be tempered to various degrees of hardness. Used to make chipping hammers, screwdrivers, chisels, and hammers.	
92. <u>Try Square</u> **Section: 3** It is marked in 8ths and 16ths of an inch. Marks 90 degree angles.	
287. <u>USS Die</u> **Section: 8** The die cuts male threads on a bolt or rod. USS also called National Coarse (NC) thread.	
281. <u>USS Tap</u> **Section: 8** Used to cut United States Standard (USS) or National Coarse Threads (NC) in drilled holes or nuts.	

293. <u>Wing Dividers</u> **Section: 9** Used for laying out small circles, arcs, and for transferring segments from one pattern to another. Very useful when laying out transitions, elbows, and reducers. Divider tips are adjustable by loosening a set screw and spreading the tips apart.	
143. <u>Wing Nut</u> **Section: 4** Used where hand tightening is desired, such as inspection covers.	
64. <u>Wire Brush</u> **Section: 2** Used to clean machinery parts. Also used to clean and remove rust or slag from metal parts for welding.	